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Community-based approaches to intermittent preventive treatment of malaria in pregnancy

A review of recent studies

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Acronyms

ANC	antenatal care
CHW	community health worker
DALY	disability-adjusted life year
IPTp-SP	intermittent preventive treatment of malaria in pregnancy with sulfadoxine pyrimethamine
LBW	low birth weight
MiP	malaria in pregnancy
SP	sulfadoxine pyrimethamine
WHO	World Health Organization

Introduction

'So long as women have walked the earth, malaria has stalked them'. [1] Globally, approximately 125 million pregnant women are at risk of a malaria infection, an estimated 25 million of then live in tropical areas of Africa. [2, 3, 4, 5] Malaria infection in pregnancy can result in significant risks for maternal and child health, including increased risk of miscarriage, stillbirth, and low birth weight (LBW). [6] In sub-Saharan Africa, an estimated one in four women demonstrates evidence of placental infection at delivery, with a larger fraction of pregnant women's malaria infection remaining undetected and untreated. [4] In 2004, the World Health Organization (WHO) estimated that in the malaria-endemic areas of Africa, malaria-induced LBW accounted for up to 360,000 newborn deaths every year. This estimate dropped to 100,000 in 2007 [1, 5]. Overall, 11.4% of neonatal deaths and 5.7% of infant deaths in malaria-endemic areas of Africa are estimated to be caused by malaria in pregnancy (MiP). [7, 8]

Based on available evidence, the WHO recommends a three-pronged approach to the prevention and management of MiP in areas with stable transmission of *Plasmodium falciparum*, one of the two most common parasite species that cause malaria and the most deadly The approach includes the use of insecticide-treated nets, intermittent preventive treatment of malaria in pregnancy with sulfadoxine pyrimethamine (IPTp-SP), and effective case management of malarial illness. [5] Over time, the combined implementation of the WHO recommendations has proven to be an effective strategy for preventing MiP, and by 2009, the WHO reported that 35 out of 45 sub-Saharan African countries had introduced IPTp-SP into their national policy. [9] However, even with the strategies included in national policy, they are only effective when they are appropriately implemented and adhered to. [9, 10]

The WHO recommends that women receive three or more doses of SP before delivery. Per national policy guidelines, SP prophylaxis is almost exclusively administered at antenatal care (ANC) visits by qualified health workers utilizing directly observed therapy. [9, 11, 12] To ensure pregnant women receive all doses, they must attend all of their ANC appointments, clinics must maintain an adequate supply of SP, and safe drinking water must be available to swallow the SP. All of these factors present barriers to women receiving the recommended dosage; current estimates are that only 24.5% of pregnant women receive at least two doses of SP prior to delivery. [13, 14, 15]

Recent studies have been conducted throughout malaria-endemic areas of Africa where IPTp-SP compliance is low, to identify barriers to adherence to the WHO-recommended strategy and explore new strategies to improve SP uptake. Given the importance of preventing MiP, it is crucial to design and implement programs that address these barriers in order to successfully reach pregnant women.

This report reviews recent studies and articles documenting IPTp-SP implementation strategies, predominantly focused on community-driven programs that increase women's uptake of SP. A literature review sought to identify community-based approaches to improve pregnant women's uptake of IPTp-SP; among the limited research available, specific themes and methodologies for improvement were noted.

Review

PATH conducted a literature review of peer-reviewed articles/studies documenting MiP implementation strategies with a specific emphasis on community-based approaches. Searches were conducted electronically using google scholar in addition to specific library portals. Search terms including "community-based approaches to malaria in pregnancy", "malaria in pregnancy community health workers", "malaria in pregnancy antenatal care clinics". Searches were specific to ensure that only scholarly articles that were peer-reviewed were selected. Article selection sought studies utilizing both qualitative and quantitative data analysis methodologies that explored community-based approaches to IPTp-SP. Furthermore, studies identifying cost-effectiveness were also selected to identify the realistic feasibility of this implementation.

Findings

A total of 23 reports were selected as pertaining to MiP community-based approaches. Articles were analyzed based on the type of intervention implemented (i.e. CHW involvement, trainings for health workers) and how the intervention impacted IPTp-SP uptake. Selected articles described the limitations to IPTp-SP uptake and provided recommendations for future work to increase uptake.

Overall, the articles reviewed presented a relatively even split of conclusions. Ten articles discussed the importance of providing frequent training for health workers to clarify the national MiP policy and the WHO guidelines, and demonstrated an increase in facility uptake of IPTp-SP. Thirteen articles explored the outcome of community-based approaches and campaigns to improve pregnant women's uptake of IPTp-SP; some of these emphasized the importance of training community health workers (CHWs).

A majority of the articles attempted to identify barriers to IPTp-SP uptake. Frequently mentioned were drug stock outs; dependence on women's attendance at ANC appointments at least twice at the right time for receiving a dose; poor experience with health facilities; lack of IPTp-SP understanding among health workers, including health workers being unclear on national guidelines; pregnant women's inability to attend ANC appointments; and poor communication between malaria and reproductive health focal points. [9, 14, 16, 11, 17, 18, 19]

Overall, two limitations to IPTp-SP uptake were repeatedly highlighted in the articles reviewed: lack of training among health workers and the lack of community-based access to IPTp-SP.

Overcoming barriers to IPTp-SP uptake

Facility approaches

In order for IPTp-SP to be administered during ANC visits, the literature stated that it is crucial for health workers provide accurate information to pregnant women about IPTp-SP, the side effects, and the importance of completing three or more doses. In order to achieve this, health workers must understand national policy and guidelines, which usually mirror the WHO recommendations. Articles reviewed

indicate that health workers are either unclear about or unaware of their national policy, which limits their ability to accurately inform women about and distribute SP. [9, 11, 20, 21]

Improving and implementing health worker trainings will result in two improved outcomes for adherence. First, if health workers have clear guidance and understanding of the IPTp-SP strategy and know at which ANC visits to administer SP, and the supply of the drug is adequate, then pregnant women who consistently attend their ANC appointments will be offered SP. [11] Studies querying pregnant women noted that respondents often received their first dose of SP, but either were not offered SP or were unaware of the required additional dosages at subsequent ANC visits. A study conducted in Kenya found that 81% of women reported attending one ANC visit, 78% reported attending at least twice, and 34% reported four or more visits. Of these women, 55% reported receiving their first dose of SP, 30% reported receiving a second dose, and only 9% reported receiving a third dosage. [15] In another study, conducted in Tanzania, pregnant women admitted low adherence because they felt they had received poor-quality services from the health provider and recommended that health workers receive training to increase their knowledge of IPTp-SP. [22]

Studies also reported that if health workers are trained and knowledgeable on IPTp-SP, they will be able to educate pregnant women on the importance of SP, which will influence their decision to request the drug. In addition, pregnant women will teach others about the importance of IPTp. [11] In Nigeria, pregnant women who responded to a survey stated that if health workers explained the side effects and knowledgably responded to their concerns about taking SP, they would follow the instructions and take the prophylaxis. [9]

Community-based approaches

In several regions in malaria-endemic areas in Kenya, Nigeria, Tanzania, and Uganda, community-based approaches to address MiP were piloted with great success. [4, 14, 19] A large Ugandan study explored ways to improve SP uptake and noted that community-based approaches are cost-effective and could increase both ANC attendance and SP uptake. [14, 23]

A community-based approach that utilized CHWs to meet with pregnant women in Nigeria to encourage ANC attendance demonstrated a significant increase in the number of women who received two or more doses of SP, suggesting the benefit of CHW involvement in SP distribution. [4] A qualitative study in Uganda interviewed pregnant mothers and demonstrated that women would feel more comfortable receiving their drugs and information from their CHW, with whom they have an established relationship. Moreover, the study reported that women preferred the community-based approach because they did not have to travel to a clinic, which required their husband's permission. [14, 24] Additional research revealed that community distribution of IPTp-SP through vendors, community mobilizers, and other trained members of the community increased women's adherence to receiving two or more doses of SP. [25, 26, 27, 28] A study in Tanzania also noted that ANC supplemented with community-based interventions improved adherence. [18] A study in Malawi demonstrated the feasibility of using female volunteers, which led to an improvement in IPTp-SP adherence. [29] An Ugandan study evaluated the cost-effectiveness of implementing a community-based approach to IPTp-SP delivery in comparison to disability-adjusted life years (DALYs) and concluded that community-based approaches cost US$1.10 per DALY averted, demonstrating the cost-effectiveness of these programs. [23]

Several studies that evaluated the effectiveness of CHWs in distributing SP also measured women's attendance at ANC clinics. These studies have repeatedly demonstrated the positive outcome of community-based approaches using trained CHWs to implement IPTp-SP and promote ANC attendance: attendance increased, most likely because women were receiving information from a trusted source, encouraging them to attend their appointments. [4]

Conclusion

The use of community-based approaches and, specifically, the use of CHWs to administer drugs is an effective methodology to treat patients. The onchocerciasis control program proved that community-directed approaches were more effective than health facility-directed programs. [30] Tuberculosis programs across the globe have claimed that approximately 89% of their surviving patients were treated using a community-based program of twice-weekly fully supervised treatment implemented by trained CHWs. [31]

Recent studies are validating the efficiency and cost-effectiveness of community-based approaches for MiP, specifically community-based distribution of IPTp-SP. Given pregnant women's lack of awareness of the importance of receiving multiple doses of IPTp-SP, and the lack of knowledge among health facility workers on how to increase adherence to ANC and improve IPTp-SP compliance, it is imperative to develop a multi-pronged approach that incorporates community-based approaches and facility approaches to ensure that women receive accurate information and at least three doses of SP in pregnancy. Moreover, community-based approaches will ensure that family decision-makers (husbands and mothers-in-law) and other women in the community are educated on the importance IPTp-SP so they can support pregnant women in adhering to the drug regimen. Finally, these approaches will contribute to removing many of the barriers to and misperceptions about the IPTp-SP strategy and will help to ensure that women take the appropriate dosage.

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